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68-80, XP000451097 CHANG ET AL: "An Open-
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Description**Field of the Invention**

[0001] This invention relates to a method and system for optimizing transmission efficiency and access capacity on a communications network; and particularly, to a method, system and viewbox for an efficient Video-on-Demand Multimedia Server System.

Background of the Invention

[0002] Supplying Video-On-Demand, (VOD) can be expensive, inefficient and complex. Ideally, a server should quickly satisfy a users request for a video program. This can be accomplished by serving the video program on a separate channel for each user. This can be an expensive proposition for systems with many users. An alternative is providing Near-Video-On-Demand (NVOD), wherein a video program is repeatedly made available to users at some fixed staggered time interval. User requests on a NVOD system are thus subject to delays of up to the staggered time interval, which is typically many minutes.

[0003] NVOD systems do not satisfy the needs of potential users such as 'Surfers' browsing through many channels to determine which video program to view. Surfers typically desire quick request satisfaction. With NVOD, this can theoretically be satisfied by utilizing an insignificant, e.g., one second, stagger interval. In the most simplistic way this would require the program to be simultaneously broadcast on a number of channels equal to the number of seconds of the program duration. For example, a program taking 2 hours (7,200 seconds, with the start of each channel staggered at a one second interval from another) would require 7,200 channels. A method and system is needed which can efficiently provide Video-on-Demand in a cost-effective manner and which is easily adaptable to current technology.

SUMMARY OF THE INVENTION

[0004] The Hybrid Video-on-Demand (HVOD) method and system of the present invention employs a server operating in NVOD mode, i.e., wherein multiple copies of each program are continuously sent on separate channels. The start of each copy is offset by a staggered time interval

[0005] The method, system and viewbox in accordance with the invention are claimed in independent claims 1, 9, 10, 16 and 17.

[0006] The method, system and apparatus of the present invention advantageously fulfills VOD user requests asynchronously with the start of an NVOD channel, while maintaining primary use of the NVOD transmission for that requestor.

[0007] According to a preferred embodiment of the present invention there is provided a method of provid-

ing video-on-demand of the type wherein a video program is repeatedly transmitted at a staggered time interval from a video-on-demand-server to a viewbox wherein the viewbox is responsive to the video-on-demand-server which receives a request for the video program. The method comprising, at a head end: assigning and routing a beginning portion of the video program to the viewbox, responsive to the receipt of the request for the video program; and at a receiver end: selecting an in-progress transmission of the video program and storing it in a buffer associated with the viewbox, responsive to the request for the video program; selecting the beginning portion of the video program for output, responsive to the assigning step; and contiguously splicing the in-progress transmission stored in the buffer to a conclusion of the beginning portion of the video program, for output by the viewbox.

[0008] According to another aspect of the present invention there is provided a viewbox for use with a video-on-demand system of the type wherein a video program is repeatedly transmitted at a staggered time interval from a video-on-demand-server, comprising: means for selecting an in-progress transmissions of the video program and storing it in a buffer responsive to the request for the video program; means for receiving from the video-on-demand server a beginning portion of video program, for output by the viewbox; and means for contiguously splicing the in-progress transmission stored in the buffer to the conclusion of the beginning portion of the video program, for output by the viewbox.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] Figure 1 is a block diagram of an embodiment of a hybrid video-on-demand multimedia server system according to the present invention.

[0010] Figure 2a is a timing diagram of a prior art Near-video-on-demand system (NVOD) of a type wherein a video program is repeatedly made available at a 10 minute staggered time interval.

[0011] Figure 2b is a timing diagram of an embodiment according to the present invention to be read concurrently with Figure 2a, illustrating a request for a video program occurring at time T_{req} that is asynchronous with the previous Near-video-on-demand (NVOD) $NVODA2$ program start and offset therefrom by an amount T_{tar} .

[0012] Figure 2c is a timing diagram of an embodiment according to the present invention to be read concurrently with Figures 2a and 2b illustrating the serving of a separate user channel which contains a beginning portion of the video program associated with the request and which is routed to a user in response to a request.

[0013] Figure 2d is a timing diagram of an embodiment according to the present invention to be read concurrently with Figures 2a, 2b and 2c illustrating the timing and method of storing to and reading from a buffer the immediately previous transmission of a video pro-

gram, in response to a request.

[0014] Figure 2e is a timing diagram of an embodiment according to the present invention to be read concurrently with Figures 2a, 2b, 2c and 2d illustrating the timing and method of using a 10% lead-in with each separate user channel.

[0015] Figure 2f is a timing diagram of an embodiment according to the present invention to be read concurrently with Figures 2a, 2b, 2c, 2d, and 2e illustrating the timing and method of using a 10% lead-in with each video program repeatedly made available at a staggered time interval.

[0016] Figure 3 is a flow chart of a preferred embodiment of a method of providing video-on-demand according to the present invention.

[0017] Figure 4 is a schematic block diagram of a viewbox including a dual selection and splicing mechanism according to an embodiment of the present invention.

Description of the Preferred Embodiments

[0018] Figure 1 illustrates an embodiment of a cable television signal distribution system, specifically a 'Hybrid Video-on-Demand Multimedia Server System' (HMSS) according to the present invention. C.F.R. As is temporally illustrated in Figure 2a, the system of the present invention is of a type commonly referred to as Near-video-on-demand (NVOD) wherein a video program is repeatedly made available at a staggered time interval Tstag. Returning now to Figure 1, an NVOD system is transmitted from a VOD-server 100 on a plurality of channels coupled by transmission line 110 and Interactive Network and Controller (INAC) 140 to a plurality of television receivers (TV) 195 through a viewbox 160 coupled between the INAC 140 and each TV 195.

[0019] The INAC 140 provides a bi-directional transport means, transmission bandwidth and control to satisfy user requests which may be made by a user interface associated with each viewbox. Those skilled in the art will appreciate that the INAC can be implemented by existing cable television (CATV) networks, e.g., the interactive cable systems of the type described in U.S. Pat. Nos. 4,290,142, 4,408,345, and 4,710,955 which are hereby incorporated by reference.

[0020] The transmission line 110 also includes a plurality of channels assignable for transmission of a beginning portion of each requested program from the VOD-server to the requesting viewbox when a request is made asynchronous with the start of one of the staggered programs. A buffer 180 is also associated with each viewbox 160 for storing the immediately previous one of the staggered programs associated with a request. Each viewbox further is associated with a dual selection and splicing mechanism (DSS) 150 which is responsive to the VOD-server for splicing the immediately previous transmission of the requested program to the conclusion of the beginning portion of the requested

program for uninterrupted on-demand presentation to the requesting viewer on the TV 195.

[0021] The program request includes the information necessary for the VOD-server to selectively address and control the requesting viewbox 160 functions by means well known to those skilled in the art. For example, U.S. patent 5,206,722 which is hereby incorporated by reference utilizes a conventional set top box including an appropriately programmed microcontroller and frequency sensitivity keying receiver to perform remote channel switching for video on demand service. In U.S. Pat. No. 4,461,032 which is hereby incorporated by reference a CATV service controller is disclosed which includes a control address circuit for receiving address and operating mode control signals from the head end. A microcontroller is a device that typically includes a microprocessor plus other associated circuitry such as random access memory (RAM), serial input/output, and/or analog-to-digital conversion (ADC) capabilities. Accordingly, the microcontroller's functions could be performed by a microprocessor plus other external associated circuitry, but the term "microcontroller" is used herein because that is the term commonly used for such devices in commercial viewboxes.

[0022] The term "channel" means a band of video frequencies which are suitable for transmitting sufficient information to permit reconstruction of the video image and the audio sound by the TV 195, e.g., as in a standard NTSC channel. In addition, general central computer control of a CATV distribution system is well known in the art, does not form a part of the present invention, and therefore will not be discussed further herein.

[0023] In the following description, numerous well-known components are shown in block diagram form in order not to obscure the described inventive concepts in unnecessary detail. In other instances, specific details are provided in order that these inventive concepts may be clearly understood. It will be apparent to those skilled in the art that the described inventive concepts may be employed without use of these specific details and that the scope of the present invention is not limited by their disclosure.

[0024] The function of the viewbox 160 and the dual selection and splicing mechanism 150 illustrated in Figure 1 are depicted in Figure 4. The viewbox 160 has an input coupled to transmission line 110 which may include a dedicated channel called the Service Information Channel (SIC) 400 which is used by the VOD-server 100 to send the viewbox 160 a menu of programs available for user viewing. The SIC 400 preferably also carries viewbox address and program control information used by the viewbox 160, e.g., to determine which channels carry the signals needed for each program; the real clock time starting instant of each offering and the stagger interval therebetween, as well as a continuous transmission of the precise present time of day (preferably updated to fractional seconds) in order to synchronize the splicing of secondary and primary channel content

for uninterrupted output by the viewbox 160.

[0025] Each viewbox 160 may include a user interface 480 for transmitting a program request via a return path 490 in the transmission line 110 to the VOD-server 100 for a video program associated with the request. Alternatively, the return path 490 could be implemented independently of the INAC 140 in any one of the several ways well known to those skilled in the art, without departing from the true spirit and scope of the invention. For example, U.S. Patent No. 4,995,078 which is hereby incorporated by reference discloses a system wherein viewers use a telephone to make requests either to a customer service representative or by use of an "auto-dial" device which would allow the requester to communicate directly with a scheduling computer included with the VOD-server. The viewbox 160 may also include an internal clock 450 to provide more precise timing synchronization for the DSS 150 and which will be discussed later. In a preferred embodiment the DSS 150 further comprises a microcontroller 440 which may be programmed by conventional means well known in the art to control tuning circuit 500 which may include SIC/NVOD tuner/modulator 420 and Userchan tuner/modulator 410. Specifically, microcontroller 440 may be programmed to tune the SIC/NVOD tuner/modulator 420 to the SIC 400 channel to receive instructions from the VOD-server 100 and/or store the control, address, and/or timing information in the microcontroller's internal RAM (if of sufficient capacity), and/or auxiliary memory 460 shown connected by dashed lines, and/or buffer 180. Alternatively, the address and operating mode control signals could be transmitted during the vertical interval of the cable television signal by means well known in the art. For example, U.S. Patent No. 4,222,068 discloses encoder means for inserting data signals into selected retrace lines of the vertical interval and decoder means responsive to these data signals and selectively enabled or disabled thereby.

[0026] The tuning circuit 500 is preferably under programmed control of microcontroller 440 which uses the aforementioned address and operating mode control signals received from the VOD-server 100 to tune the Userchan tuner/modulator 410 to the assigned one of a plurality of channels USERCHAN 1201-120n containing the beginning portion of the requested program corresponding to a request received asynchronous to the start of any NVOD transmission of that program. The Userchan tuner/modulator 410 processes the signal so that it can be displayed by TV 195. Those skilled in the art will appreciate that the duration of the beginning portion may be less than or equal to Tstag and still be within the true spirit and scope of the invention.

[0027] Returning to Figure 4, the microcontroller 440 may also be programmed, based on the control and timing information obtained from the SIC 400, to simultaneously tune the SIC/NVOD tuner/modulator 420 to the immediately previous NVOD transmission. Referring now to Figure 2d, the viewbox may commence recircu-

latingly storing the immediately previous NVOD transmission in the buffer 180 at the conclusion of the current staggered time interval. Preferably the buffer is of a type commonly known as a "hard drive" capable of alternate read and write operations. The microcontroller 440 may also be programmed to commence reading the buffer 180 for output to the TV 195 at a point offset by an amount Ttag relative to the input of the program request, i.e., Treq. Returning to Figure 4, the microcontroller 440 is also programmed to simultaneously disconnect the Userchan tuner/modulator 410 output to the TV 195, thereby effectively "splicing" the beginning portion of the requested program to the previous NVOD transmission stored in the buffer for uninterrupted viewing on TV 195. Thereafter, the microcontroller is programmed to recirculating write to and read from the buffer 180 for the remainder of the previous NVOD transmission for output to the TV 195.

[0028] The timing synchronization required for the aforementioned splicing may be accomplished using the aforementioned VOD-server generated precise present time of day, e.g., updated to 0.1 second increments, in conjunction with internal clock 450 which may be used to more precisely calculate the offset, e.g., milliseconds between receipt of the program request and the conclusion of the current Ttag period.

[0029] It will be appreciated by those skilled in the art that there are several ways to splice the beginning portion to the NVOD portion without departing from the true spirit and scope of the invention. For example, the MPEG standards have been developed by the Moving Picture Experts Group (MPEG), part of a joint technical committee of the International Standards Organization (ISO) and the International Electrotechnical Commission (IEC). The MPEG committee has been developing standards for the multiplexed, compressed representation of video and associated audio signals. The MPEG-1 (1.5Mb/s) transmission protocol allows upwards of 26 programs and MPEG-2 (3Mb/s) 12 programs to be transmitted on a single NTSC analog channel. Thus, tuning circuit 500 may comprise a single tuner capable of simultaneously receiving video/audio information corresponding to both the beginning portion of the program and the immediately previous NVOD transmission.

[0030] It will also be appreciated by those skilled in the art that the present invention is adaptable to numerous combinations of analog or digital transmissions and/or topologies without departing from the true spirit and scope of the invention. For example, analog-TV-to-digital-TV converter (ADC) 470 (shown connected by dashed lines) can be incorporated to allow the use of analog signals on transmission line 110 in combination with the preferred "hard drive" buffer 180. In this case, tuning circuit 500 could comprise analog mixers and detectors well known to those skilled in the art. Alternatively, buffer 180 could be an analog device. As an alternative to the use of SIC 400, the VOD-server may transmit appropriate signals containing an address portion there-

by actuating a frequency signal keying (FSK) receiver 430 directing the signals to the microcontroller 440. The FSK is shown connected by dashed lines. The microcontroller 440 may be programmed by conventional means well known in the art to perform the functions responsive to the instructions or timing information transmitted from the VOD-server to accomplish the aforementioned features of the present invention.

[0031] There are various improvements that would result in increased efficiency of the HMSS. First, note that all synchronous user requests can be satisfied with the same USERCHAN service and NVOD service. The requirement of (almost) exact coincidence of user requests to enable the use of the same USERCHAN is extremely limiting. Thus, the vast majority of VOD requests would require separate USERCHAN assignments. This could require a large number of separate USERCHAN assignments.

[0032] Figure 2e illustrates another embodiment of the present invention, wherein a purposely protracted lead-in for each video program makes each of the plurality of channels USERCHAN 1201- 120u available for a larger number of potential HVOD users and further enables transparent grouping of HVOD users. The lead-in is such that any portion of it satisfies the apparent start of the user requested program. Thus, if the lead-in duration is T_{ld} seconds, all HVOD users that make requests within T_{ld} seconds will be served by the same USERCHAN. Thus, the maximum number of separate USERCHAN 1201-120u required is reduced. For example, if T_{ld} is set at 10% of T_{tag} , there can be at most a requirement for 10 separate USERCHAN 1201-12010 transmissions. Preferably, the lead-in is specially prepared; or alternatively the repetition of the starting video frame by zooming it in and out repeatedly. It may use techniques known to those in the art to make a moving segment from a single or multiple frames.

[0033] Referring now to Figure 2f, an embodiment in accordance with the present invention is shown wherein a lead-in (10% in this example) is used with each NVOD transmission to yield an increase in the number of HVOD requestors that are satisfied directly by NVOD without a USERCHAN assignment. Referring now to Figure 2a, absent a USERCHAN assignment, a VOD user request would only be satisfied entirely by this prior art NVOD system if the request is synchronous with the start of the requested program. Thus, for Program-A, the request must coincide (or just precede) time S_{pr-A1} , S_{pr-A2} , or S_{pr-A3} , etc. It thus appears that the vast majority of HVOD requesters would require a USERCHAN assignment. Returning to Figure 2f, user-transparent grouping of HVOD users is accomplished by using the lead-in for each video program in all the NVOD transmissions. In this case also, as explained above, if the lead-in duration is $T_{lead-in}$ seconds, all HVOD users that make requests within $T_{lead-in}$ seconds of the start of a NVOD will be served by that same NVOD. If $T_{lead-in}$ is set at 10% of T_{tag} , all HVOD users that occur with-

in the period $T_{lead-in}$ from T_{tag} will be satisfied by that same NVOD transmission.

[0034] The combined use of a lead-in for both USERCHAN and NVOD purposes would result in further increases in total HVOD efficiency. For example, if $T_{lead-in}$ is set at 10% for both purposes the maximum number of USERCHAN assignments required is reduced to 9.

[0035] Figure 3 illustrates a flow chart of a method according to the present invention for providing video-on-demand of the type wherein a video program is repeatedly made available at a staggered time interval over a transmission line to a viewbox adapted to transmit a request for a video program associated with the request. At step 400 the VOD-server makes available program control and timing information over the transmission line to each viewbox. At step 410 the user selects a program to view at time T_{req} via the user interface associated with viewbox 160. At step 420, the View-Box 160 determines the request is asynchronous to the start of any of the repeated transmissions of the requested program and sends a signal representing the request for a beginning portion of the video program to the VOD-Server 100 via return path 490 in transmission line 110. At step 425, the VOD-server receives the request; assigns a selected one of the USERCHAN 1201-120u and notifies the requesting viewbox. At step 430, the VOD-Server 100 quickly satisfies the request by serving the beginning portion of the requested video through the transmission line 110, on the assigned USERCHAN, for viewing via viewbox 160. Referring now to Figure 2c, the assigned USERCHAN, e.g., USERCHAN 1201, containing the beginning of the requested program may be served to the requesting viewbox for a time equal to the NVOD stagger interval, T_{tag} .

[0036] Returning now to Figure 3, in step 440, the requesting viewbox 160 selects the assigned USERCHAN 1201 and couples the beginning portion of the requested program for output to the requestor's TV 195. Referring now to Figure 2d, the viewbox 160 concurrently stores the immediately previous (in-progress) NVOD transmission of the program, NVODA2 in this case, in buffer 180. The buffer 180 storage is preferably done in a recirculating manner and commences offset from the immediately previous NVOD program (NVODA2 in this case) start by an amount corresponding to T_{tag} from the actual start (of NVODA2). This service connection is continued for the remaining duration of the program. Those skilled in the art will appreciate that although the preferred embodiment is described in terms of staggered time interval T_{tag} , the USERCHAN service and buffer storage commencement could be minimized to T_{tar} = the tardiness of T_{req} from the start of the previous (already in progress) NVOD transmission NVODA2, without departing from the true spirit and scope of the invention.

[0037] Preferably the buffer 180 is continuously and recirculating written with the immediately previous NVOD transmission of the program in order to minimize

the size of the buffer 180 required. When the buffer end (top) is reached, filling (STORE) is continued by over-writing the buffer 180 from its beginning (bottom).

[0038] In step 450, with reference to Figures 2c and 2d, the viewbox 160 terminates the USERCHAN service connection and starts feeding the buffer 180 out at the conclusion of the USERCHAN service, so as to effectively splice the stored NVOD video frames to the end of the USERCHAN service, and thereafter continuously and recirculating read from the buffer 180 to the TV 195 until completion of the requested program. Thus, the buffer 180 capacity need not be much larger than Tstag. The READ is delayed from the WRITE by a fixed interval TDLY equal to the tardiness of the user request from the start time of the immediately preceding program NVODA2 start. The remainder of the requested program NVODA2 is thus output for uninterrupted viewing by the user.

[0039] From the above description of the preferred embodiment of the invention it will be apparent to those skilled in the art that numerous modifications and alterations may be made to the system and method of the present invention, other than those already described, without departing from the basic inventive concepts. For example, the method, system and apparatus of the present invention are also useful for other server applications servicing a family of users on a single or multi-media provision. It uses HVOD as described only because it is expected to be the initial application of the present invention. All such modifications and alterations are to be considered within the scope of the present invention the nature of which is to be determined from the foregoing description and the appended claims.

[0040] The following features are also characteristics of the invention:

- When providing video-on-demand of the type wherein a video program is repeatedly transmitted at a staggered time interval from a video-on-demand-server to a viewbox, at a receiver end, an in-progress transmission of the video program is selected and stored in a buffer associated with the viewbox, responsive to a request for the video program; a beginning portion of the video program provided by the video-on-demand-server is selected for output by the viewbox responsive to the request for the video program; and the in-progress transmission of the video program stored in the buffer to the conclusion of the beginning portion of the video program is contiguously spliced for output by the viewbox.

- The duration of the beginning portion of the video program is equal to or greater than the delay of the request from the in-progress transmission of the video program and less than or equal to the staggered time interval.

5 - The storing is done in a recirculating manner; and the splicing step further comprises reading the immediately previous commenced transmission of the video program stored in the buffer in a recirculating manner.

10 - The beginning portion of the video program further comprises a lead-in.

15 - The video program repeatedly transmitted at a staggered time interval further comprises a lead-in.

- The remotely controlled switching device of the video-on-demand system comprises a microcontroller.

20 - The remotely controlled switching device of the video-on-demand system is further adapted for recirculatingly storing to and reading from the buffer.

25 - The remotely controlled switching device of the viewbox comprises a microcontroller.

- The remotely controlled switching device of the viewbox is further adapted for recirculatingly storing to and reading from the buffer.

30 - The viewbox comprises a display for viewing the video program.

Claims

1. A method of providing video-on-demand of the type wherein a video program is repeatedly transmitted at a staggered time interval from a video-on-demand-server (100) to a viewbox (160) wherein the viewbox (160) is responsive to the video-on-demand-server (100) which receives a request for the video program, the method comprising the steps of: at a head end:

35 assigning and routing a beginning portion of the video program to the viewbox (160), responsive to the receipt of the request for the video program; and at a receiver end:

40 selecting an in-progress transmission of the video program and storing it in a buffer (180) associated with the viewbox (160), responsive to the request for the video program;

45 selecting the beginning portion of the video program for output, responsive to the assigning step; and

50 contiguously splicing the in-progress transmission stored in the buffer (180) to a conclusion of the beginning portion of the video program, for output by the viewbox (160).

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2. A method of providing video-on-demand as claimed in claim 1 wherein the beginning portion of the video program is of a duration equal to or greater than the delay of the request from a start of the in-progress transmission of the video program. 5

3. A method of providing video-on-demand as claimed in claim 1 wherein the beginning portion of the video program is of a duration less than or equal to the staggered time interval. 10

4. A method as claimed in claim 1 wherein said storing is done in a recirculating manner; and wherein the splicing step further comprises reading the in-progress transmission stored in the buffer (180) in a recirculating manner. 15

5. A method of providing video-on-demand as claimed in claim 1 wherein the beginning portion of the video program associated with the request further comprises a lead-in portion. 20

6. A method of providing video-on-demand as claimed in claim 1 wherein the video program repeatedly transmitted at a staggered time interval further comprises a lead-in portion. 25

7. A method of providing video-on-demand as claimed in claim 1 wherein said storing commences at a point advanced from the start of the in-progress transmission of the video program by an amount equal to the duration of the beginning portion of the video program. 30

8. A method of providing video-on-demand as claimed in claim 1 further comprising the step of displaying the video program associated with the request on a display (195), responsive to the viewbox (160) selecting the beginning portion of the video program for output. 35

9. A video-on-demand system of the type wherein a video program is repeatedly transmitted at a staggered time interval from a video-on-demand-server (100) to a viewbox (160) via a transmission line (110) communicatively coupled therebetween, the system comprising:
at a head end:
means for assigning and routing a beginning portion of the video program from the video-on-demand-server (100) to the viewbox (160) associated with and responsive to the receipt of a request for the video program;
and at a receiver end:
means (420) for selecting an in-progress one of the repeated transmissions of the video program and storing it in a buffer (180) associated 40

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with the viewbox (160), responsive to the request for the video program;
means (410) for selecting the beginning portion of the video program assigned and routed by the video-on-demand-server (100) for output by the viewbox (160); and
means (440) for contiguously splicing the in-progress transmission stored in the buffer (180) to a conclusion of the beginning portion of the video program, for output by the viewbox (160).
10. A video-on-demand system of the type wherein a video program is repeatedly transmitted at a staggered time interval from a video-on-demand-server (100) to a viewbox (160) via a transmission line (110) communicatively coupled therebetween, the system comprising:
at a head end:
the video-on-demand-server (100) being adapted for assigning and routing a beginning portion of the video program from the video-on-demand-server (100) to the viewbox (160), in response to a request for the video program;
and at a receiver end:
the viewbox (160) having an input coupled to the transmission line (110) and an output, the viewbox (160) further including
a tuning circuit (500) having a first output, a second output, an input and a control point wherein the first output is switchably coupled to the output of the viewbox (160), the input being coupled to the input of the viewbox (160);
a remotely controlled switching device (440) having a first output, a second output, and an input coupled to the input of the viewbox (160);
the second output of the remotely controlled switching device (440) being coupled to the control point of the tuning circuit (500) for switchably selecting both the beginning portion of the video program routed from the video-on-demand-server (100) and an in-progress transmission of the video program associated with the request;
wherein the beginning portion of the video program routed from the video-on-demand-server (100) is switchably coupled to the first output of the tuning circuit (500) and the selected in-progress transmission of the video program is switchably coupled to the second output of the tuning circuit (500); and

a buffer (180) for storing the selected in-progress transmission of the video program;

the buffer (180) including a first input, a second input, and an output wherein the output of the buffer (180) is switchably coupled to the output of the viewbox (160), the second input of the buffer (180) is coupled to the second output of the tuning circuit (500), and the first input of the buffer (180) is coupled to the first output of the switching device (440), and

wherein the remotely controlled switching device (440) is further adapted for contiguously splicing the in-progress transmission stored in the buffer (180) to a conclusion of the beginning portion of the video program associated with the request for output by the viewbox (160).

11. A video-on-demand system as claimed in claim 10 wherein the beginning portion of the video program is of a duration equal to or greater than the delay of the request from a start of the in-progress transmission of the video program.

12. A video-on-demand system as claimed in claim 10 wherein the beginning portion of the video program associated with the program request is of a duration less than or equal to the staggered time interval.

13. A video-on-demand system as claimed in claim 10 wherein the beginning portion of the video program associated with the request further comprises a lead-in portion.

14. A video-on-demand system as claimed in claim 10 wherein the video program repeatedly made available at a staggered time interval further comprises a lead-in portion.

15. A video-on-demand system as claimed in claim 10 wherein the remotely controlled switching device (440) is further adapted for commencing storing the in-progress transmission of the video program in the buffer (180) at a point advanced by an amount equal to the duration of the beginning portion of the video program.

16. A viewbox (160) for use with a video-on-demand system of the type wherein a video program is repeatedly transmitted at a staggered time interval from a video-on-demand-server (100) to said viewbox (160) via a transmission line (110) communicatively coupled therebetween, said viewbox (160), comprising:

means (420) for selecting an in-progress transmission of the video program and storing it in a

buffer (180) responsive to the request for the video program;

means (410) for receiving from the video-on-demand server (100) a beginning portion of video program responsive to the request for the video program, for output by the viewbox (160); and

means (440) for contiguously splicing the in-progress transmission stored in the buffer (180) to the conclusion of the beginning portion of the video program, for output by the viewbox (160).

17. A viewbox (160) having an output and an input, the input adapted for coupling to a receiver end of a video-on-demand system of a type wherein a video-on-demand-server (100) coupled to a head end repeatedly transmits a video program at a staggered time interval, the video-on-demand-server (100) being further adapted for assigning and routing a beginning portion of the video program to the viewbox (160), in response to a request for the video program, the viewbox (160) comprising:

a tuning circuit (500) having a first output, a second output, an input and a control point wherein the first output is switchably coupled to the output of the viewbox (160), the input being coupled to the input of the viewbox (160);

a remotely controlled switching device (440) having a first output, a second output, and an input coupled to the input of the viewbox (160);

the second output of the remotely controlled switching device (440) being coupled to the control point of the tuning circuit (500) for switchably selecting both the beginning portion of the video program and an in-progress transmission of the video program associated with the request;

wherein the selected beginning portion of the video program is switchably coupled to the first output of the tuning circuit (500) and the selected in-progress transmission of the video program is switchably coupled to the second output of the tuning circuit (500); and

a buffer (180) for storing the selected in-progress transmission of the video program;

the buffer (180) including a first input, a second input, and an output wherein the output of the buffer (180) is switchably coupled to the output of the viewbox (160), the second input of the buffer (180) being coupled to the second output

of the tuning circuit (500), and the first input of the buffer (180) being coupled to the first output of the switching device (440);

wherein the remotely controlled switching device (440) is further adapted for contiguously splicing the selected in-progress transmission stored in the buffer (180) to a conclusion of the beginning portion of the video program associated with the request for output by the viewbox (160).

18. A viewbox (160) as claimed in claim 17 wherein the beginning portion of the video program is equal to or greater than a duration of the delay of the request from a start of the in-progress transmission of the video program and less than or equal to the staggered time interval.

19. A viewbox (160) as claimed in claim 17 wherein the beginning portion of the video program associated with the request further comprises a lead-in portion.

20. A viewbox (160) as claimed in claim 17 wherein the video program repeatedly transmitted at a staggered time interval further comprises a lead-in portion.

Patentansprüche

1. Ein Verfahren, das ein Video-auf-Anfrage des Typs vorsieht, in dem ein Videoprogramm wiederholt in einem gestaffelten Zeitintervall von einem Video-auf-Anfrage-Server (100) in eine Sichtbox (160) übertragen wird, in dem die Sichtbox (160) auf einen Video-auf-Anfrage-Server (100) anspricht, der eine Anforderung nach dem Videoprogramm erhält, wobei das Verfahren die folgenden Schritte umfaßt: an einem Kopfende:

Zuordnen und Leiten eines Anfangsteils des Videoprogramms zur Sichtbox (160) als Reaktion auf den Eingang der Anforderung nach dem Videoprogramm; und an einem Empfängerende:

Anwahl einer gerade im Gang befindlichen Übertragung des Videoprogramms und Abspeichern desselben in einem der Sichtbox (160) zugeordneten Puffer (180) als Reaktion auf die Anforderung nach dem Videoprogramm;

Anwahl des Anfangsteils des Videoprogramms zur Ausgabe als Reaktion auf den Zuordnungsschritt; und

lückenloses Zusammenhängen der im Puffer

(180) gespeicherten im Gang befindlichen Übertragung mit einem Ende des Anfangsteils des Videoprogramms zur Ausgabe durch die Sichtbox (160).

- 5 2. Ein Verfahren zum Vorsehen des Video-auf-Anfrage gemäß Anspruch 1, in dem der Anfangsteil des Videoprogramms von einer Spielzeit ist, die gleich oder länger ist als die Verzögerung der Anforderung von einem Start der im Gang befindlichen Übertragung des Videoprogramms.
- 10 3. Ein Verfahren zum Vorsehen des Video-auf-Anfrage gemäß Anspruch 1, in dem der Anfangsteil des Videoprogramms von einer Spielzeit ist, die kürzer oder gleich dem gestaffelten Zeitintervall ist.
- 15 4. Ein Verfahren gemäß Anspruch 1, in dem das Speichern in umlaufender Weise vorgenommen wird; und in dem der Zusammenhangsschritt ferner das Lesen der im Gang befindlichen, im Puffer (180) abgespeicherten Übertragung in umlaufender Weise beinhaltet.
- 20 5. Ein Verfahren zum Vorsehen des Video-auf-Anfrage gemäß Anspruch 1, in dem der Anfangsteil des Videoprogramms von einer Spielzeit ist, die kürzer oder gleich dem gestaffelten Zeitintervall ist.
- 25 6. Ein Verfahren zum Vorsehen des Video-auf-Anfrage gemäß Anspruch 1, in dem das wiederholt in gestaffelten Zeitintervallen übertragene Videoprogramm einen Einführungsteil aufweist.
- 30 7. Ein Verfahren zum Vorsehen des Video-auf-Anfrage gemäß Anspruch 1, in dem das Abspeichern an einem Punkt beginnt, der gegenüber dem Anlaufen der im Gang befindlichen Übertragung des Videoprogramms um einen Betrag vorgeschoben ist, der gleich der Spielzeit des Anfangsteils des Videoprogramms ist.
- 35 8. Ein Verfahren zum Vorsehen des Video-auf-Anfrage gemäß Anspruch 1, das ferner den Schritt des Anzeigens des der Anforderung zugeordneten Videoprogramms auf einem Anzeigebildschirm (195) als Reaktion auf das Auswählen des Anfangsteils des Videoprogramms zur Ausgabe durch die Sichtbox (160) umfaßt.
- 40 9. Ein Video-auf-Anfrage-System des Typs, in dem ein Videoprogramm wiederholt in einem gestaffelten Zeitintervall von einem Video-auf-Anfrage-Server (100) in eine Sichtbox (160) übertragen wird, mit einer Übertragungsleitung, die kommunikativ zwischen ihnen gekoppelt ist, wobei das System umfaßt: an einem Kopfende:
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Mittel zum Zuordnen und Leiten eines Anfangsteils des Videoprogramms vom Video-auf-Anforderungs-Server (100) zur Sichtbox (160) zugeordnet einer Anforderung nach einem Videoprogramm und auf diese reagierend und an einem Empfängerende:

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Mittel (420) zur Anwahl einer gerade im Gang befindlichen wiederholter Übertragungen des Videoprogramms und Abspeichern desselben in einem der Sichtbox (160) zugeordneten Puffer (180) als Reaktion auf die Anforderung nach dem Videoprogramm;

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Mittel (410) zur Anwahl des Anfangsteils des dem Video-auf-Anfrage-Server (100) zugeordneten und von diesem zur Ausgabe durch die Sichtbox (160) geführten Videoprogramms; und

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Mittel zum lückenlosen Zusammenhängen der im Puffer (180) gespeicherten im Gang befindlichen Übertragung mit einem Ende des Anfangsteils des Videoprogramms zur Ausgabe durch die Sichtbox (160).

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10. Ein Video-auf-Anfrage-System des Typs, in dem ein Videoprogramm wiederholt in einem gestaffelten Zeitintervall von einem Video-auf-Anfrage-Server (100) in eine Sichtbox (160) über eine zwischen ihnen kommunikativ gekoppelte Übertragungsleitung (110) übertragen wird, und das System aufweist: an einem Kopfende:

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den Video-auf-Anfrage-Server (100), der ausgelegt ist zum Zuordnen und Leiten eines Anfangsteils des Videoprogramms von dem Video-auf-Anfrage-Server (100) zur Sichtbox (160) als Reaktion auf den Eingang der Anforderung nach dem Videoprogramm; und an einem Empfängerende:

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die Sichtbox (160) mit einem Eingang, der an die Übertragungsleitung (110) gekoppelt ist, und mit einem Ausgang, wobei die Sichtbox (160) ferner beinhaltet

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einen Abstimmenschaltkreis (500) mit einem ersten Ausgang, einem zweiten Ausgang, einem Eingang und einem Bezugspunkt, in dem der erste Ausgang schaltbar an den Ausgang der Sichtbox (160) gekoppelt ist, der Eingang schaltbar an den Eingang der Sichtbox (169) gekoppelt ist;

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eine ferngesteuerte Schaltvorrichtung (440) mit einem ersten Ausgang, einem zweiten Ausgang und einem Eingang, der an den Eingang der Sichtbox (160) gekoppelt ist;

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wobei der zweite Ausgang der Fernsteuer-Schaltvorrichtung (440) an den Bezugspunkt des Abstimmenschaltkreises (500) gelegt ist zum schaltbaren Anwählen sowohl des Anfangsteils des Videoprogramms, das vom Video-auf-Anfrage-Server (100) geleitet wird, als auch einer im Gang befindlichen Übertragung des der Anfrage zugeordneten Videoprogramms;

wobei der Anfangsteil des vom Video-auf-Anfrage-Server (100) geleiteten Anfangsteils schaltbar an den ersten Ausgang des Abstimmenschaltkreis (500), und die angewählte, gerade im Gang befindliche Übertragung des Videoprogramms schaltbar an den zweiten Ausgang des Abstimmenschaltkreises (500) gekoppelt ist; und

einen Puffer (180) zum Abspeichern der angewählten, gerade in Gang befindlichen Übertragung des Video-programms;

wobei der Puffer (180) einen ersten Eingang, einen zweiten Eingang und einen Ausgang umfaßt, wobei der Ausgang des Puffers (180) schaltbar an den Ausgang der Sichtbox (160) gekoppelt ist, der zweite Eingang des Puffers (180) an den zweiten Ausgang des Abstimmenschaltkreises (500) gekoppelt ist, und der erste Eingang des Puffers (180) an den ersten Ausgang der Schaltvorrichtung (440) gekoppelt ist; und

wobei die ferngesteuerte Schaltvorrichtung (440) ferner ausgelegt ist zum lückenlosen Verbinden der gerade ablaufenden Übertragung, die im Puffer (180) gespeichert ist, mit einem Ende des Anfangsteils des Videoprogramms, das der Anforderung zugeordnet ist, zwecks Ausgabe durch die Videobox (160).

11. Ein Video-auf-Anfrage-System gemäß Anspruch 10, in dem der Anfangsteil des Videoprogramms eine Spielzeit aufweist, die gleich oder länger ist als die Verzögerung der Anforderung gegenüber einem Anlaufen der im Gang befindlichen Übertragung des Videoprogramms.

12. Ein Video-auf-Anfrage-System gemäß Anspruch 10, in dem der Anfangsteil des der Programmanforderung zugeordneten Videoprogramms eine Spielzeit aufweist, die kürzer oder gleich dem gestaffelten Zeitintervall ist.

13. Ein Video-auf-Anfrage-System gemäß Anspruch 10, in dem der Anfangsteil des der Anforderung zugeordneten Video-programms ferner einen Einführungsteil umfaßt.

14. Ein Video-auf-Anfrage-System gemäß Anspruch 10, in dem das wiederholt in gestaffelten Zeitintervallen verfügbar gemachte Videoprogramm ferner einen Einführungsteil aufweist. 5

15. Ein Video-auf-Anfrage-System gemäß Anspruch 10, in dem die ferngesteuerte Schaltvorrichtung (440) ferner ausgelegt ist zum Anlaufenlassen der Abspeicherung der gerade ablaufenden Übertragung des Videoprogramms in den Puffer (180) an einem Punkt, der um einen Betrag vorgeschoben ist, der gleich der Spielzeit des Anfangsteils des Video-Programms ist. 10

16. Eine Sichtbox (160) zum Einsatz mit einem Video-auf-Anfrage-System eines Typs, in dem ein Videoprogramm in einem gestaffelten Zeitintervall von einem Video-auf-Anfrage-Server (100) wiederholt zur Sichtbox (160) über eine Übertragungsleitung (110) übertragen wird, die kommunikativ zwischen die beiden gekoppelt ist, wobei die Sichtbox (160) umfaßt: 15

Mittel (420) zur Anwahl einer gerade im Gang befindlichen Übertragung des Videoprogramms und Abspeichern desselben in einen Puffer (180) als Reaktion auf die Anforderung nach dem Videoprogramm; 20

Mittel (410) zum Empfangen eines Anfangsteils des Videoprogramms, das auf die Anforderung des Videoprogramms anspricht, von dem Video-auf-Anforderung-Server (100), zur Ausgabe über die Sichtbox (160); und 25

Mittel (440) zum lückenlosen Zusammenhängen der im Puffer (180) gespeicherten, im Gang befindlichen Übertragung mit dem Ende des Anfangsteils des Videoprogramms zur Ausgabe durch die Sichtbox (160). 30

17. Eine Sichtbox (160) mit einem Ausgang und einem Eingang, wobei der Eingang so ausgelegt ist, daß er an ein Empfängerende eines Video-auf-Anfrage-Systems eines Typs gekoppelt wird, in dem ein an ein Kopfende gekoppelter Video-auf-Anfrage-Server (100) wiederholt ein Videoprogramm in gestaffelten Zeitabständen überträgt, wobei der Video-auf-Anfrage-Server (100) ferner so ausgelegt ist, daß er einen Anfangsteil des Videoprogramms zuordnet und zur Sichtbox (160) leitet als Reaktion auf eine Anforderung des Videoprogramms, wobei die Sichtbox umfaßt: 35

einen Abstimmenschaltkreis (500) mit einem ersten Ausgang, einem zweiten Ausgang, einem Eingang und einem Steuerpunkt, in dem der erste Ausgang schaltbar an den Ausgang der 40

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5. Sichtbox (160) gekoppelt ist, der Eingang an den Eingang der Sichtbox (169) gekoppelt ist; eine ferngesteuerte Schaltvorrichtung (440) mit einem ersten Ausgang, einem zweiten Ausgang und einem Eingang, der an den Eingang der Sichtbox (160) gekoppelt ist; wobei der zweite Ausgang der Fernsteuer-schaltvorrichtung (440) an den Steuerpunkt des Abstimmenschaltkreises (500) gelegt ist zum schaltbaren Anwählen sowohl des Anfangsteils des Videoprogramms, als auch einer im Gang befindlichen Übertragung des der Anforderung zugeordneten Videoprogramms; wobei der angewählte Anfangsteil des Videoprogramms schaltbar an den ersten Ausgang des Abstimmenschaltkreises (500) gekoppelt ist und die angewählte gerade im Gang befindliche Übertragung des Videoprogramms schaltbar an den zweiten Ausgang des Abstimm-schaltkreises (500) gekoppelt ist; und wobei der Puffer (180) zum Abspeichern der ange-wählten, gerade in Gang befindlichen Übertragung des Videoprogramms; wobei der Puffer (180) einen ersten Eingang, einen zweiten Eingang und einen Ausgang auf-weist, wobei der Ausgang des Puffers (180) schaltbar an den Ausgang der Sichtbox (160) gekoppelt ist, der zweite Eingang des Puffers (180) an den zweiten Ausgang des Abstimm-schaltkreises (500) gekoppelt ist, und der erste Eingang des Puffers (180) an den ersten Aus-gang der Schaltvorrichtung (440) gekoppelt ist; wobei die ferngesteuerte Schaltvorrichtung (440) ferner ausgelegt ist zum lückenlosen Ver-bin den der gerade ablaufenden Übertragung, die im Puffer (180) gespeichert ist, mit einem Ende des Anfangsteils des Videoprogramms, das der Anforderung nach Ausgabe über die Sichtbox (160) zugeordnet ist. 40

18. Eine Sichtbox (160) gemäß Anspruch 17, in der der Anfangsteil des Videoprogramms gleich/länger als die Dauer der Verzögerung der Anforderung gegen-über einem Anlaufen der gerade in Gang befindlichen Übertragung des Videoprogramms, und klei-ner/gleich dem gestaffelten Zeitintervall ist. 45

19. Eine Sichtbox (160) gemäß Anspruch 17, in der der Anfangsteil des der Anforderung zugeordneten Vi-deo-programms ferner einen Anfangsteil enthält. 50

20. Eine Sichtbox (160) gemäß Anspruch 17, in der das

Videoprogramm, das wiederholt in gestaffelten Zeitintervallen übertragen wird, ferner einen Anfangsteil enthält.

Revendications

1. Procédé de fourniture de vidéo à la demande du type dans lequel un programme vidéo est transmis de façon répétitive à un intervalle de temps échelonné depuis un serveur de vidéo à la demande (100) jusqu'à un boîtier de présentation (160) dans lequel le boîtier de présentation (160) répond au serveur vidéo à la demande (100) qui reçoit une demande concernant le programme vidéo, le procédé comprenant les étapes consistant à :
 - au niveau d'une tête de réseau : l'affectation et l'acheminement d'une partie de début du programme vidéo vers le boîtier de présentation (160), en réponse à la réception de la demande concernant le programme vidéo, et à l'extrémité du récepteur :

la sélection d'une transmission en cours du programme vidéo et sa mémorisation dans une mémoire tampon (180) associée au boîtier de présentation (160), répondant à la demande concernant le programme vidéo,

la sélection de la partie de début du programme vidéo en vue d'une sortie, en réponse à l'étape d'affectation, et

le raccordement contigu dans la transmission en cours mémorisée dans la mémoire tampon (180) jusqu'à une conclusion de la partie de début du programme vidéo, en vue d'une sortie par le boîtier de présentation (160).

2. Procédé de fourniture de vidéo à la demande selon la revendication 1, dans lequel la partie de début du programme vidéo est d'une durée supérieure ou égale au retard de la demande depuis le début de la transmission en cours du programme vidéo.

3. Procédé de fourniture de vidéo à la demande selon la revendication 1, dans lequel la partie de début du programme vidéo est d'une durée inférieure ou égale à l'intervalle de temps échelonné.

4. Procédé selon la revendication 1, dans lequel ladite mémorisation est exécutée suivant un principe de recirculation, et dans lequel l'étape de raccordement comprend en outre la lecture de la transmission en cours mémorisée dans la mémoire tampon (180) suivant un principe de recirculation.

5. Procédé de fourniture de vidéo à la demande selon

la revendication 1, dans lequel la partie de début du programme vidéo associé à la demande comprend en outre une partie de tête.

6. Procédé de fourniture de vidéo à la demande selon la revendication 1, dans lequel le programme vidéo transmis de façon répétitive à un intervalle de temps échelonné comprend en outre une partie de tête.
7. Procédé de fourniture de vidéo à la demande selon la revendication 1, dans lequel ladite mémorisation débute à un point en avance par rapport au début de la transmission en cours du programme vidéo d'une valeur égale à la durée de la partie de début du programme vidéo.
8. Procédé de fourniture de vidéo à la demande selon la revendication 1, comprenant en outre l'étape consistant à afficher le programme vidéo associé à la demande sur un dispositif d'affichage (195), répondant à la sélection par le boîtier de présentation (160) de la partie de début du programme vidéo en vue d'une sortie.
9. Système de vidéo à la demande du type dans lequel un programme vidéo est transmis de façon répétitive à un intervalle de temps échelonné à partir d'un serveur de vidéo à la demande (100) à un boîtier de présentation (160) par l'intermédiaire d'une ligne de transmission (110) reliée par des communications entre ceux-ci, le système comprenant au niveau d'une tête de réseau :
 - un moyen destiné à affecter et à acheminer une partie de début du programme vidéo depuis le serveur de vidéo à la demande (100) vers le boîtier de présentation (160) associé à une demande concernant le programme vidéo et en réponse à la réception de celle-ci,
 - et au niveau d'une extrémité de récepteur,
 - un moyen (420) destiné à sélectionner une transmission en cours parmi les transmissions répétées du programme vidéo et à la mémoriser dans une mémoire tampon (180) associée au boîtier de présentation (160), en réponse à la demande concernant le programme vidéo,
 - un moyen (410) destiné à sélectionner la partie de début du programme vidéo affecté et acheminé par le serveur vidéo à la demande (100) en vue d'une sortie par le boîtier de présentation (160), et
 - un moyen (440) destiné à raccorder de façon contiguë la transmission en cours mémorisée dans la mémoire tampon (180) avec une con-

clusion de la partie de début du programme vidéo, en vue d'une sortie par le boîtier de présentation (160).

10. Système de vidéo à la demande du type dans lequel un programme vidéo est transmis de façon répétitive à un intervalle de temps échelonné depuis un serveur de vidéo à la demande (100) vers un boîtier de présentation (160) par l'intermédiaire d'une ligne de transmission (110), reliée par des communications entre ceux-ci, le système comprenant : 5
au niveau d'une tête de réseau :
le serveur vidéo à la demande (100) qui est conçu pour affecter et acheminer une partie de début du programme vidéo depuis le serveur de vidéo à la demande (100) jusqu'au boîtier de présentation (160), en réponse à une demande concernant le programme vidéo, 10
et au niveau d'une extrémité de récepteur :
le boîtier de présentation (160) comportant une entrée reliée à la ligne de transmission (110) et une sortie, le boîtier de présentation (160) comprenant en outre 15
un circuit d'accord (500) comportant une première sortie, une seconde sortie, une entrée et un point de commande dans lequel la première sortie est reliée de façon commutable à la sortie du boîtier de présentation (160), l'entrée étant reliée à l'entrée du boîtier de présentation (160), 20
un dispositif de commutation commandé à distance (440) comportant une première sortie, une seconde sortie et une entrée reliée à l'entrée du boîtier de présentation (160), 25
la seconde sortie du dispositif de commutation commandé à distance (440) étant reliée au point de commande du circuit d'accord (500) en vue de sélectionner, de façon commutable, à la fois la partie de début du programme vidéo acheminé depuis le serveur de vidéo à la demande (100) et une transmission en cours du programme vidéo associé à la demande, 30
dans lequel la partie de début du programme vidéo acheminé depuis le serveur de vidéo à la demande (100) est reliée de façon commutable à la première sortie du circuit d'accord (500) et la transmission en cours sélectionnée du programme vidéo est reliée de façon commutable à la seconde sortie du circuit d'accord (500), et 35
une mémoire tampon (180) destinée à mémoriser la transmission en cours sélectionnée du programme vidéo, 40
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la mémoire tampon (180) comprenant une première entrée, une seconde entrée et une sortie, dans lequel la sortie de la mémoire tampon (180) est reliée de façon commutable à la sortie du boîtier de présentation (160), la seconde entrée de la mémoire tampon (180) est reliée à la seconde sortie du circuit d'accord (500), et la première entrée de la mémoire tampon (180) est reliée à la première sortie du dispositif de commutation (440), et 55

dans lequel le dispositif de commutation commandé à distance (440) est en outre conçu pour raccorder façon contiguë la transmission en cours mémorisée dans la mémoire tampon (180) à une conclusion de la partie de début du programme vidéo associé à la demande en vue d'une sortie par le boîtier de présentation (160).

11. Système de vidéo à la demande selon la revendication 10, dans lequel la partie de début du programme vidéo est de durée supérieure ou égale au retard de la demande depuis le début de la transmission en cours du programme vidéo. 20
12. Système de vidéo à la demande selon la revendication 10, dans lequel la partie de début du programme vidéo associée à la demande de programme est d'une durée inférieure ou égale à l'intervalle de temps échelonné. 25
13. Système de vidéo à la demande selon la revendication 10, dans lequel la partie de début du programme vidéo associé à la demande comprend en outre une partie de tête. 30
14. Système de vidéo à la demande selon la revendication 10, dans lequel le programme vidéo rendu disponible de façon répétitive à un intervalle de temps échelonné comprend en outre une partie de tête. 35
15. Système de vidéo à la demande selon la revendication 10, dans lequel le dispositif de commutation commandé à distance (440) est en outre conçu pour débuter la mémorisation de la transmission en cours du programme vidéo dans la mémoire tampon (180) à un point en avance d'une valeur égale à la durée de la partie de début du programme vidéo. 40
16. Boîtier de présentation (160) destiné à être utilisé avec un système de vidéo à la demande du type dans lequel un programme vidéo est transmis de façon répétitive à un intervalle de temps échelonné depuis un serveur de vidéo à la demande (100) vers ledit boîtier de présentation (160) par l'intermédiaire d'une ligne de transmission (110), reliée par des 45
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communications entre ceux-ci, ledit boîtier de présentation (160) comprenant :

un moyen (420) destiné à sélectionner une transmission en cours du programme vidéo et à la mémoriser dans une mémoire tampon (180) en réponse à la demande concernant le programme vidéo,

un moyen (410) destiné à recevoir depuis le serveur de vidéo à la demande (100) une partie de début du programme vidéo en réponse à la demande concernant le programme vidéo, en vue d'une sortie par le boîtier de présentation (160), et

un moyen (440) destiné à raccorder de façon contiguë la transmission en cours mémorisée dans la mémoire tampon (180) à la conclusion de la partie de début du programme vidéo en vue d'une sortie par le boîtier de présentation (160).

17. Boîtier de présentation (160) comportant une sortie et une entrée, l'entrée étant conçue en vue de la liaison à une extrémité de récepteur d'un système de vidéo à la demande d'un type dans lequel un serveur de vidéo à la demande (100) relié à une tête de réseau transmet de façon répétitive un programme vidéo à un intervalle de temps échelonné, le serveur de vidéo à la demande (100) étant en outre conçu pour affecter et acheminer une partie de début du programme vidéo au boîtier de présentation (160), en réponse à une demande concernant le programme vidéo, le boîtier de présentation (160) comprenant :

un circuit d'accord (500) comportant une première sortie, une seconde sortie, une entrée et un point de commande, dans lequel la première sortie est reliée de façon commutable à la sortie du boîtier de présentation (160), l'entrée étant reliée à l'entrée du boîtier de présentation (160),

un dispositif de commutation commandé à distance (440) comportant une première sortie, une seconde sortie et une entrée reliée à l'entrée du boîtier de présentation (160),

la seconde sortie du dispositif de commutation commandé à distance (440) étant reliée au point de commande du circuit d'accord (500) afin de sélectionner de façon commutable à la fois la partie de début du programme vidéo et une transmission en cours du programme vidéo associé à la demande,

dans lequel la partie de début sélectionnée du programme vidéo est reliée de façon commutable à la première sortie du circuit d'accord (500) et la transmission en cours sélectionnée du programme vidéo est reliée de façon commutable à la seconde sortie du circuit d'accord (500), et

une mémoire tampon (180) destinée à mémoriser la transmission en cours sélectionnée du programme vidéo,

la mémoire tampon (180) comprenant une première entrée, une seconde entrée et une sortie, dans lequel la sortie de la mémoire tampon (180) est reliée de façon commutable à la sortie du boîtier de présentation (160), la seconde entrée de la mémoire tampon (180) étant reliée à la seconde sortie du circuit d'accord (500), et la première entrée de la mémoire tampon (180) étant reliée à la première sortie du dispositif de commutation (440),

dans lequel le dispositif de commutation commandé à distance (440) est en outre conçu pour raccorder de façon contiguë la transmission en cours mémorisée dans la mémoire tampon (180) à une conclusion de la partie de début du programme vidéo associé à la demande en vue d'une sortie par le boîtier de présentation (160).

18. Boîtier de présentation (160) selon la revendication 17, dans lequel la partie de début du programme vidéo est supérieure ou égale à une durée du retard de la demande depuis un début de la transmission en cours du programme vidéo et est inférieure ou égale à l'intervalle de temps échelonné.

19. Boîtier de présentation (160) selon la revendication 17, dans lequel la partie de début du programme vidéo associée à la demande comprend en outre une partie de tête.

20. Boîtier de présentation (160) selon la revendication 17, dans lequel le programme vidéo transmis de façon répétitive à un intervalle de temps échelonné, comprend en outre une partie de tête.

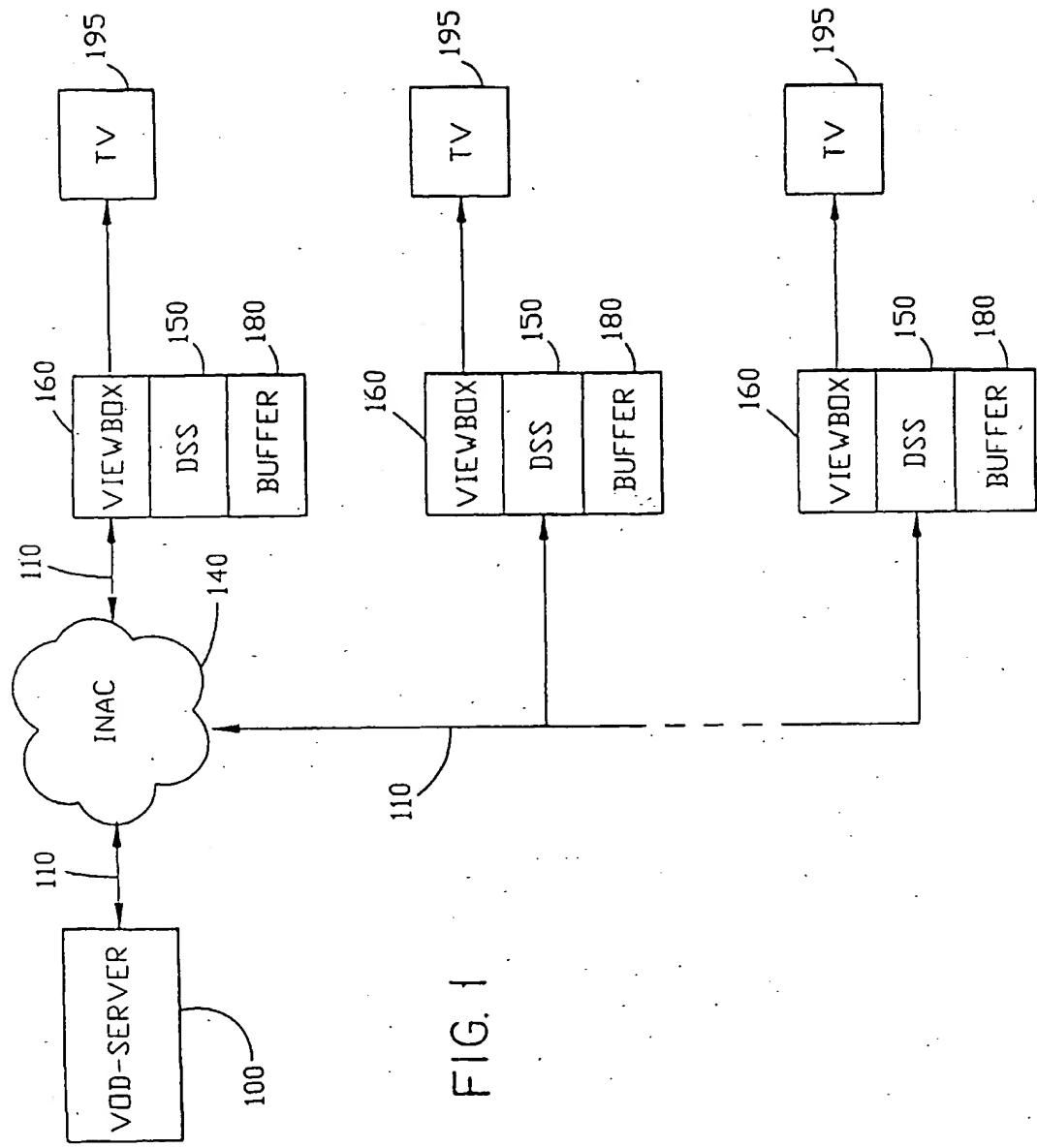


FIG. 1

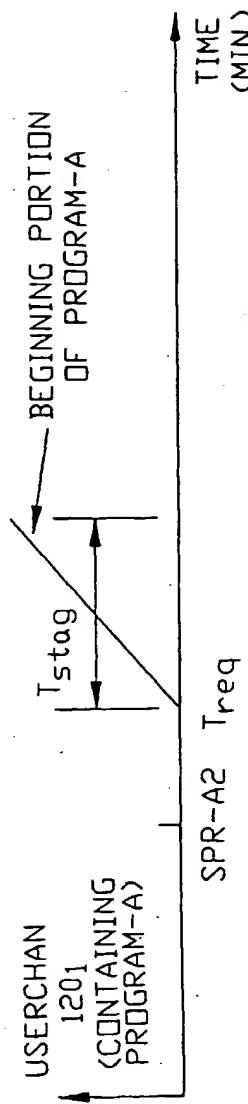
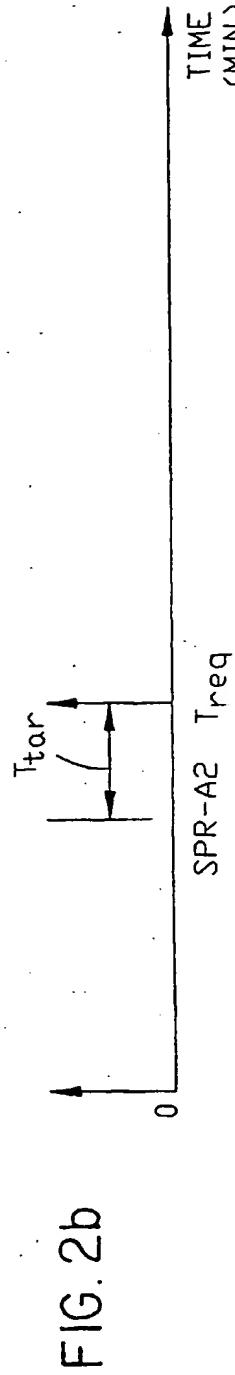
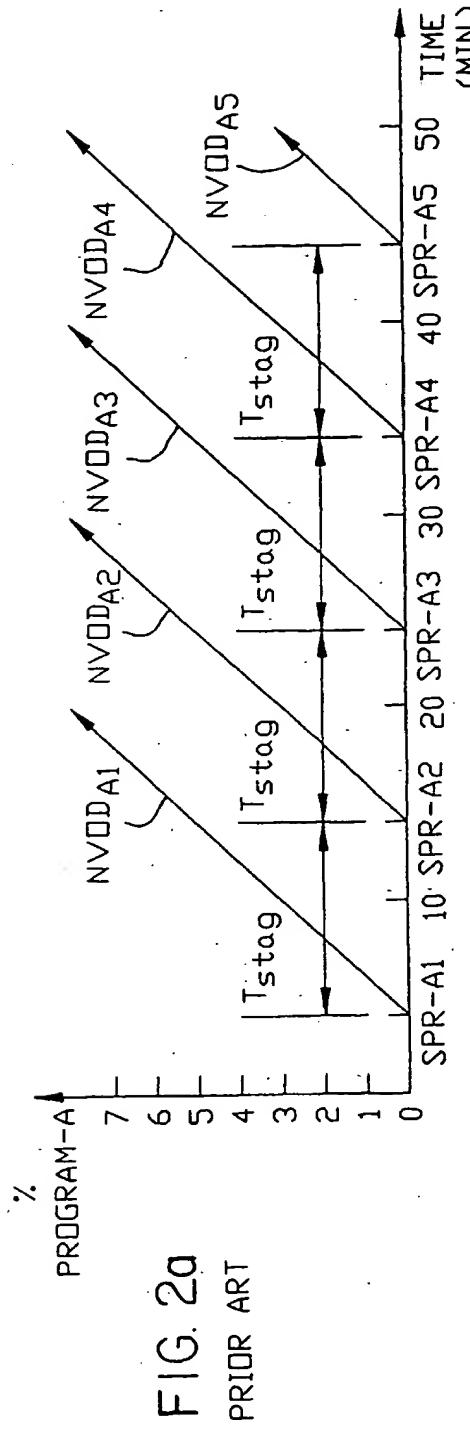




FIG. 2d

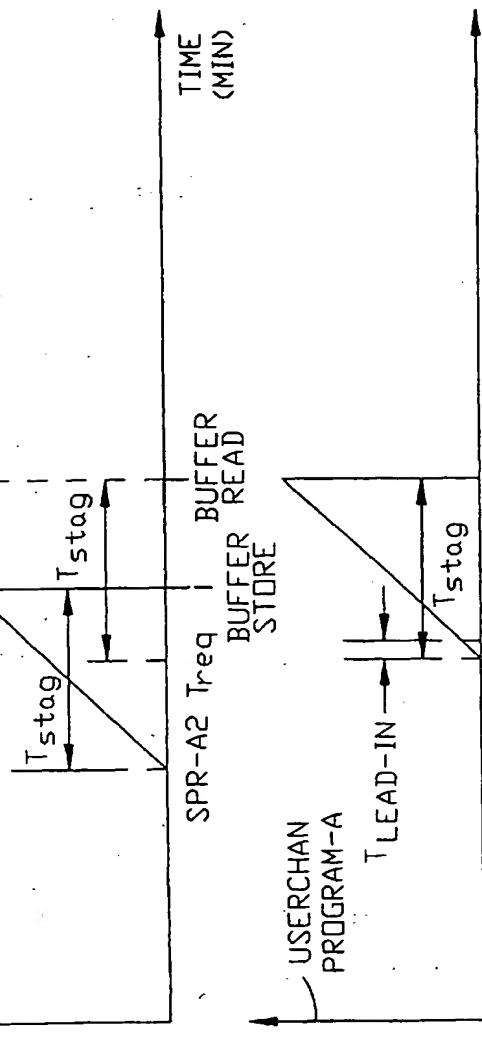


FIG. 2e

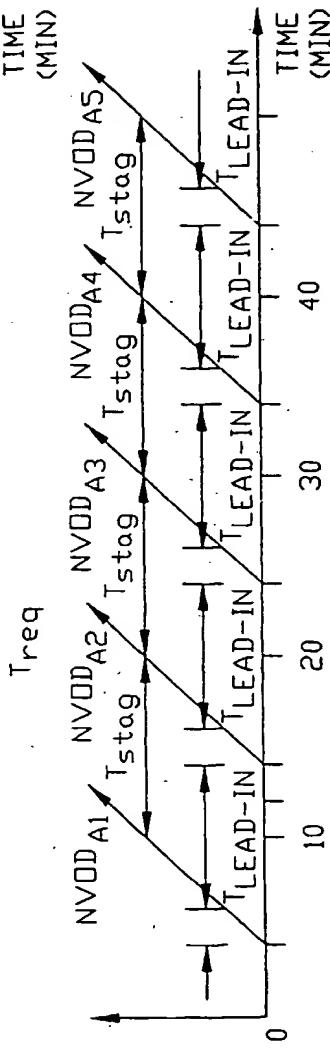


FIG. 2f

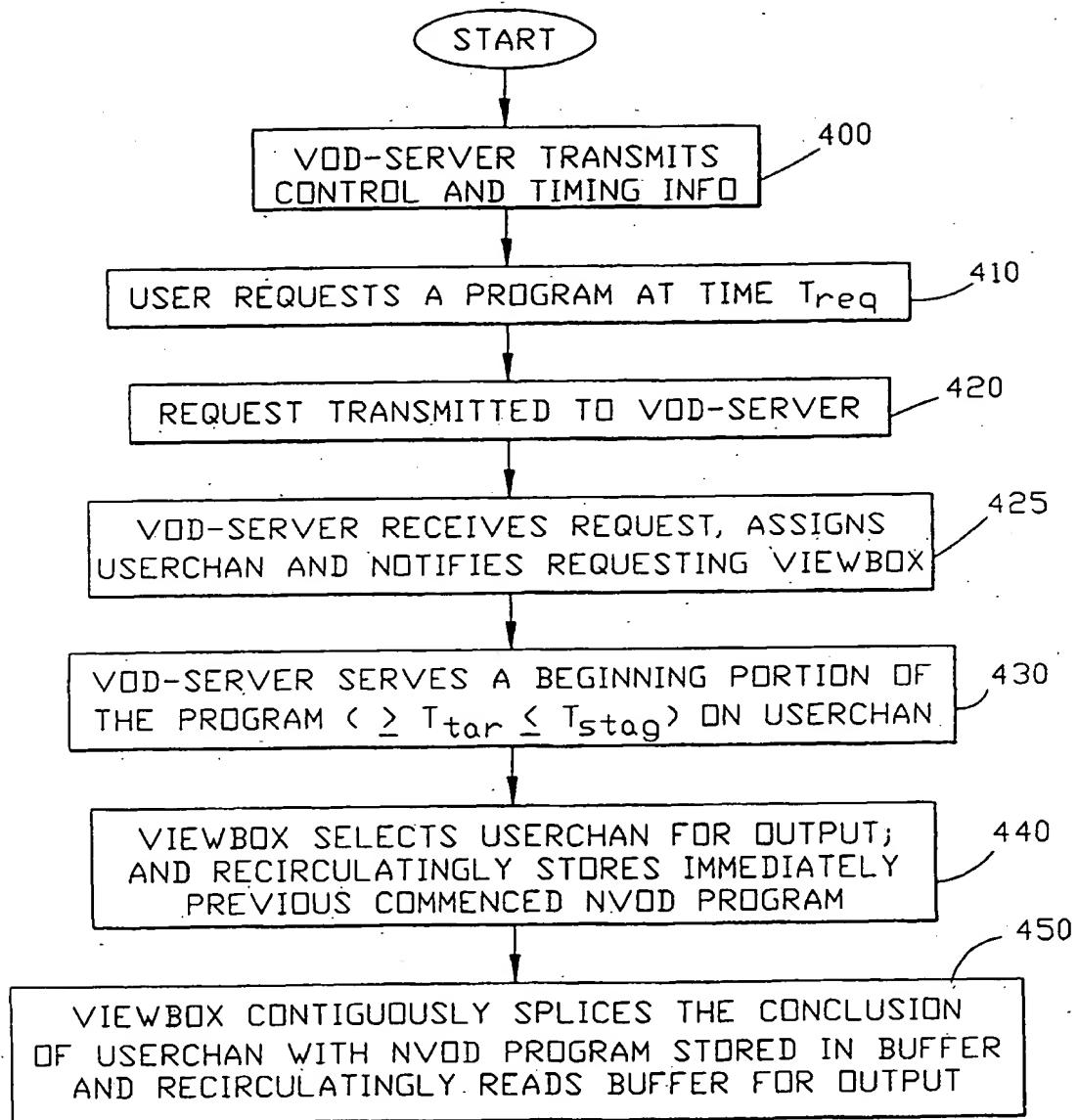


FIG. 3

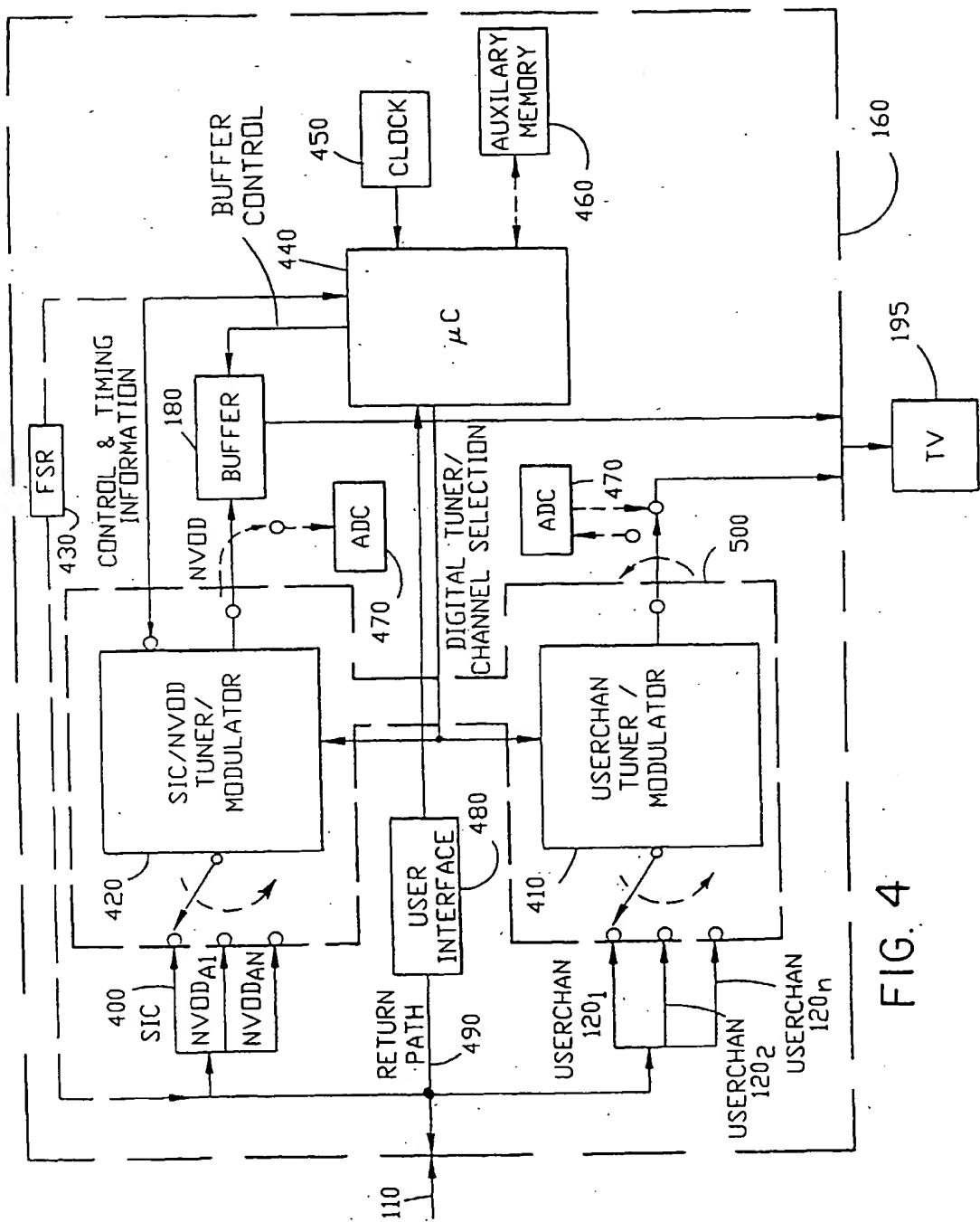


FIG. 4